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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/084,214	02/25/2002	Brian Dennis McKean	SJO920010056US1	5101
46917 7590 12/13/2007 KONRAD RAYNES & VICTOR, LLP. ATTN: IBM37 315 SOUTH BEVERLY DRIVE, SUITE 210 BEVERLY HILLS, CA 90212			EXAMINER TANG, KENNETH	
			ART UNIT 2195	PAPER NUMBER
			MAIL DATE 12/13/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/084,214

Applicant(s)

MCKEAN ET AL.

Examiner

Kenneth Tang

Art Unit

2195

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 17 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-42 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. Applicant's arguments are in response to the Amendment filed on 9/17/07. Applicant's arguments have been fully considered but are moot in view of the new grounds of rejections.
2. Claims 1-42 are presented for examination.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-42 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.
4. In claim 1, the term "the task to be completed by way of the cumulative effort of the plurality of controllers completing separately the partitions of the task" was not found to be in the specification.
5. Claims 12, 23, 34, and 42, are rejected for the same reasons as stated in the rejection of claim 1.
6. Claims 2-11, 13-22, 24-33, and 35-41 are dependent claims rejected based on their dependencies to independent claims 1, 12, 23, 34, and 42.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
8. In claim 1, the term "completely seapratly the partitions" (line 16) is spelled incorrectly and grammatically incorrect. Even after correcting the misspelled term "separately", the above term does not make sense and is grammatically incorrect. Therefore, claim 1 is indefinite since the scope of the claim cannot be ascertained.
9. Claims 12, 23, 34, and 42, are rejected for the same reasons as stated in the rejection of claim 1.
10. Claims 2-11, 13-22, 24-33, and 35-41 are dependent claims rejected based on their dependencies to independent claims 1, 12, 23, 34, and 42.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

**11. Claims 1- 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeKoning et al. (hereinafter DeKoning) (US 6,073,218) in view of Zhang et al. (hereinafter Zhang) ("A Design Methodology for Real-Time Systems to be Implemented on Multiprocessor Machines", 1996 by Elsevier Science Inc.), and further in view of Silberschatz et al. (hereinafter Silberschatz) ("Operating System Concepts: Fifth Edition", John Wiley & Sons, Inc., 1999).**

12. As to claim 1, DeKoning teaches a mass storage controller system (see Abstract, Fig. 1, 100), comprising:

a plurality of controllers (RDAC #1, Fig. 1, 118.1 and RDAC #2, Fig. 1, 118.2) for controlling an array of storage devices (plurality of Disk Drives 110), each of the plurality of controllers comprising:

a CPU for controlling the operation of a controller (Fig. 1, item 112.1);

program memory, coupled to the CPU, for storing program instructions and variables for the operation of the CPU (Fig. 1, items 114.1, 112.1, and 152.1, col. 8, lines 14-24); and

cache memory, coupled to the CPU, for storing information related to the array of storage devices (Fig. 1, items 116.1, 112.1, 150, 110);

wherein a controller of the plurality of controllers initiates a task to be performed (concurrent processing by a plurality of RAID controllers) (col. 3, lines 10-18 and 43-56), the controller initiating the task establishes a task coordination data object (semaphores, as one as example) shared by the plurality of controllers (col. 3, lines 10-18 and 43-52, col. 11, lines 6-15,

col. 12, lines 59-60), wherein the task coordination data object consists of task instructions, the task capable of being completed separately by one of the plurality of controllers to allow the task to be completed by way of the cumulative effort of the plurality of controllers completing separately the task (primary controller and secondary controller working together and completed in a cumulative effort such that the secondary controller completes the processing started by the primary controller) (col. 20, lines 18-34), and wherein a free controller (one of the plurality of RAID controlling elements) of the plurality of controllers selects a task available for completing separately and independently of the other controllers (col. 3, lines 22-58 and col. 4, lines 25-42, col. 12, lines 58-67 through col. 13, lines 22-63, col. 20, lines 18-34).

13. DeKoning is silent in having discrete partitions of the task/process and selecting a task partition during the processing.

14. However, Zhang teaches a system that can be implemented on multiprocessor machines with an operating system, wherein tasks can be partitioned into smaller tasks for parallel processing.

15. DeKoning and Zhang are analogous art because they are both in the same field of endeavor of processing tasks with a multiprocessor (each controller has a CPU in DeKoning).

16. One of ordinary skill in the art would have known to modify DeKoning's processing system such that its tasks would be broken into partitioned tasks within a larger task.

17. The suggestion/motivation for doing so would have been to provide the predicted result of a balanced system load. From the aspect of response time performance, it may be desirable to partition a large task into a number of smaller tasks in order to apply parallel processing. In some instances, parallel processing may be the "natural" way of viewing a problem or class of

problems to be solved. In other cases, due to heavy processing demands, parallel processing can be the best, perhaps only, means of providing sufficient processing power to meet strict real-time deadlines. In this respect, the purpose of task partition is to provide a favorable condition for the subsequent task allocation effort to yield a balanced system load. The condition of having a balanced system load is frequently the key to obtaining an excellent response time performance (page 45, 2<sup>nd</sup> column, last paragraph through page 46, 1<sup>st</sup> column, 1<sup>st</sup> paragraph).

18. Zhang teaches states such as "state inactive", "state ready", "state running", and "state blocked" but DeKoning in view of Zhang does not explicitly teach associating them with said task partitions.

19. However, Silberschatz teaches that during execution of every process, it changes state as it executes (page 91, Section 4.1.2 Process State). The state of a process is defined in part by the current activity of that process. Each process may be in one of the following states:

**New:** The process is being created.

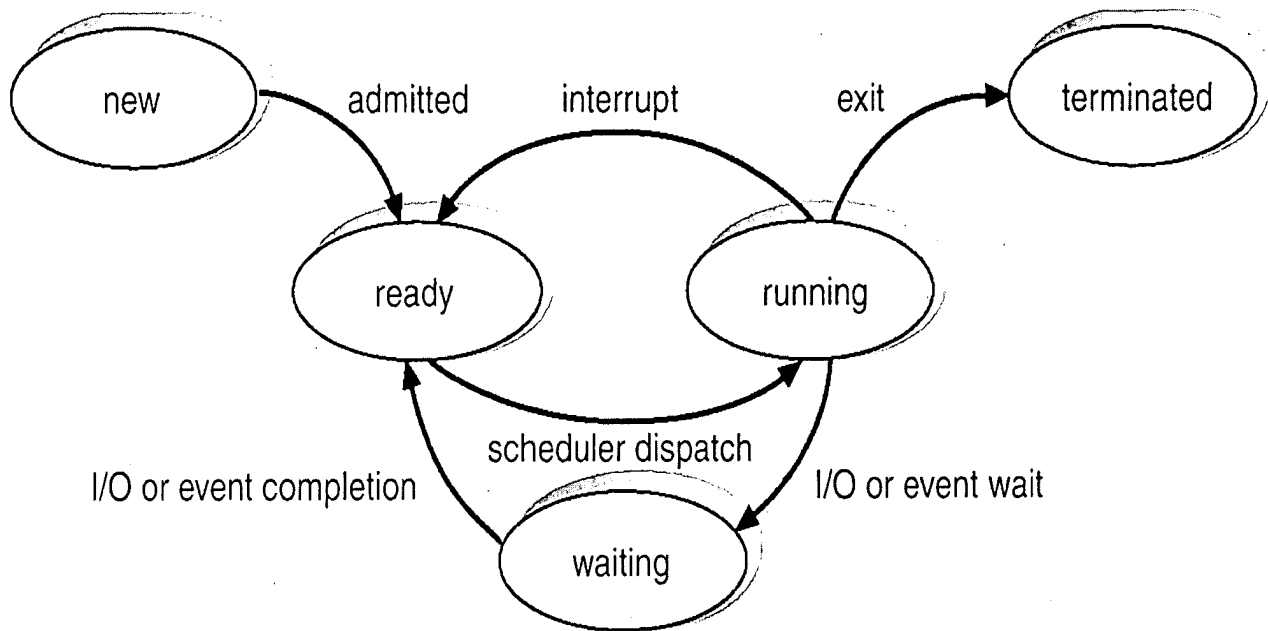
**Running:** Instructions are being executed.

**Waiting:** The process is waiting for some event to occur

**Ready:** The process is waiting to be assigned to a processor.

**Terminated:** The process has finished execution.

These names are arbitrary, and vary between operating systems. The states that they represent are found on all systems, however. And states are included in the partitioned processes, as they are just merely smaller processes of a larger process. The state diagram corresponding to these states is presented in the Figure below (page 90 Fig. 4.1):



Furthermore, every process is represented in the operating system by a process control block (PCB) – also called a task control block. A PCB contains elements of a process such as its process state, process number, program counter, registers, to name a few.

Finally, Silberschatz also discloses that a computer system is a collection of processes and objects. By objects, meaning both hardware objects (such as the CPU, memory segments, printers, disks, and tape drives), and software objects (such as files, programs, and semaphores) (pages 598, last paragraph through page 599, 1<sup>st</sup> paragraph).

20. One of ordinary skill in the art would have known to include the well known process states of ready, running, terminated, waiting, etc. that are normally included in a process to the processes/tasks of DeKoning and Zhang. The suggestion/motivation would have been to provide the predicted result of being able to monitor or control task execution by a current state of the process. Therefore, it would have been obvious to combine DeKoning, Zhang and Silberschatz to obtain the invention of claim 1.



21. As to claim 2, DeKoning (RDAC #1, Fig. 1, 118.1 and RDAC #2, Fig. 1, 118.2) in view of Zhang (page 45, 2<sup>nd</sup> column, last paragraph through page 46, 1<sup>st</sup> column, 1<sup>st</sup> paragraph), and further in view of Silberschatz (page 91, Section 4.1.2 Process State) teaches a processor/controller that uses data objects that are discretely partitioned into various states of tasks such as a ready state, a state of execution (IN PROGRESS) state, an end (COMPLETE) state, etc.

22. As to claim 3, Silberschatz teaches wherein a controller selects a partition by examining the partitions in a READY state and selecting at least one partition in the READY state to operate on (page 91, Section 4.1.2 Process State).

23. As to claim 4, Silberschatz teaches wherein a partition is in an IN PROGRESS (running) state during processing (page 91, Section 4.1.2 Process State).

24. As to claim 5, Silberschatz teaches wherein a controller sets the partition selected for processing to a COMPLETE (terminated) state upon completion of processing for a partition (page 91, Section 4.1.2 Process State).

25. As to claims 6-8 and 10, they are rejected for the same reasons as stated in the rejections of claims 2-5.

26. As to claim 9, DeKoning teaches wherein the states provide a semaphore-mechanism for allowing a controller to ascertain whether to acquire control over a partition (col. 3, lines 50-54, col. 4, lines 1-11, col. 12, lines 37-58).

27. As to claim 11, DeKoning (col. 3, lines 22-58 and col. 4, lines 25-42, col. 12, lines 58-67 through col. 13, lines 22-63, col. 20, lines 18-34) in view of Zhang (page 45, 2<sup>nd</sup> column, last paragraph through page 46, 1<sup>st</sup> column, 1<sup>st</sup> paragraph), and further in view of Silberschatz (page 91, Section 4.1.2 Process State) teaches wherein the task coordination data object includes information about an operation to be performed and a data set to be operated on.

28. As to claims 12, 23, 34, and 42, they are rejected for the same reasons as stated in the rejection of claim 1.

29. As to claims 13-19 and 21-22, these limitations are taught in Moriyama as shown in the rejections of claims 2-8 and 10-11.

30. As to claims 20 and 31, they are rejected for the same reasons as stated in the rejection of claim 9.

31. As to claims 24-30 and 32-33, these limitations are taught in Moriyama as shown in the rejections of claims 2-8 and 10-11.

32. As to claims 35-41, they are rejected for the same reasons as stated in the rejections of claims 2-6 and 10-11.

***Response to Arguments***

33. Applicant's arguments have been fully considered but are moot in view of the new grounds of rejections.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth Tang whose telephone number is (571) 272-3772. The examiner can normally be reached on 8:30AM - 6:00PM, Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kt  
12/6/07

  
**MENG-AI T. AN**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2100**